

**WHAT IS CLAIMED IS:**

1. A purified polypeptide comprising an amino acid sequence that is at least 70% identical to the amino acid sequence of SEQ ID NO:3.

5           2. The purified polypeptide of claim 1, wherein the amino acid sequence is at least 80% identical to the amino acid sequence of SEQ ID NO:3.

3. The purified polypeptide of claim 2, wherein the amino acid sequence is at least 90% identical to the amino acid sequence of SEQ ID NO:3.

10           4. The purified polypeptide of claim 3, wherein the amino acid sequence is the amino acid sequence of SEQ ID NO:3.

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5. A purified polypeptide comprising an amino acid sequence that is at least 70% identical to the amino acid sequence of SEQ ID NO:4.

6. The purified polypeptide of claim 5 wherein the amino acid sequence is at least 80% identical to the amino acid sequence of SEQ ID NO:4.

15           7. The purified polypeptide of claim 6 wherein the amino acid sequence is at least 90% identical to the amino acid sequence of SEQ ID NO:4.

8. The purified polypeptide of claim 7 wherein the amino acid sequence is the amino acid sequence of SEQ ID NO:4.

20           9.     The polypeptide of claim 1 or claim 5, wherein the polypeptide has a MDH-like activity.

10. A method of screening for a compound that binds to an MDH-like polypeptide, the method comprising:

providing the polypeptide of claim 1;  
contacting the polypeptide with a test compound;  
and detecting binding of the test compound to the polypeptide.

11. The method of claim 10, further comprising measuring an MDH-like activity of the polypeptide.

12. The method of claim 10, further comprising the steps of:

providing a second MDH-like polypeptide, wherein the second MDH-like polypeptide is a plant or mammalian MDH-like polypeptide;  
contacting the second polypeptide with the test compound;  
and detecting binding of the test compound to the second polypeptide.

13. A method of screening for a compound that alters the activity of an MDH-like polypeptide, the method comprising:

providing the polypeptide of claim 1;  
contacting the polypeptide with a test compound;  
and measuring an MDH-like activity of the polypeptide, wherein a change in MDH-like activity relative to the MDH-like activity of the polypeptide in the absence of the test compound is an indication that the test compound alters the activity of the polypeptide.

14. The method of claim 13, further comprising the steps of:

providing a second MDH-like polypeptide, wherein the second MDH-like polypeptide is a plant or mammalian MDH-like polypeptide;  
contacting the second polypeptide with the test compound;  
and measuring an MDH-like activity of the second polypeptide.

15. A method of screening for a compound that binds to an MDH-like polypeptide, the method comprising:

providing the polypeptide of claim 5;  
contacting the polypeptide with a test compound;  
and detecting binding of the test compound to the polypeptide.

5 16. The method of claim 15, further comprising measuring an MDH-like activity of the polypeptide.

17. The method of claim 15, further comprising the steps of:  
providing a second polypeptide, wherein the second MDH-like polypeptide is a plant  
or mammalian MDH-like polypeptide;  
contacting the second polypeptide with the test compound;  
10 and detecting binding of the test compound to the second polypeptide.

18. A method of screening for a compound that alters the activity of an MDH-like  
polypeptide, the method comprising:  
providing the polypeptide of claim 5;  
contacting the polypeptide with a test compound;  
15 and measuring an MDH-like activity, wherein a change in MDH-like activity relative  
to the MDH-like activity of the polypeptide in the absence of the test compound is an  
indication that the test compound alters the activity of the polypeptide.

19. The method of claim 18, further comprising the steps of:  
providing a second polypeptide, wherein the second MDH-like polypeptide is a plant  
20 or mammalian MDH-like polypeptide;  
contacting the second polypeptide with the test compound;  
and measuring an MDH-like activity of the second polypeptide.

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20. An antibody that binds specifically to a polypeptide consisting of SEQ ID NO: 3.

21. The antibody of claim 20, wherein the antibody does not bind to the polypeptides having the amino acid sequence of SEQ ID NO:7 or 8.

22. An antibody that binds specifically a polypeptide consisting of SEQ ID NO: 4.

23. The antibody of claim 22, wherein the antibody does not bind to the polypeptides  
5 having the amino acid sequence of SEQ ID NO:7 or 8.

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